EXHIBIT D

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Paper 26
Date: November 4, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

MPH TECHNOLOGIES OY,
Patent Owner.

IPR2019-00823
Patent 9,712,494 B2

Before SALLY C. MEDLEY, KAMRAN JIVANI, and JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Apple Inc. ("Petitioner") challenges the patentability of claims 1–11 ("the challenged claims") of U.S. Patent No. 9,712,494 B2 (Ex. 1001, "the '494 patent"), owned by MPH Technologies Oy ("Patent Owner"). We have jurisdiction under 35 U.S.C § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons discussed herein, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3, 5–8, and 10 are unpatentable, but Petitioner has not shown by a preponderance of the evidence that claims 2, 4, 9, and 11 are unpatentable.

II. BACKGROUND

A. Procedural History

Petitioner filed a Petition requesting *inter partes* review of the challenged claims of the '494 patent. Paper 2 ("Pet."). The Petition is supported by the Declaration of David Goldschlag, Ph.D. (Ex. 1002). Patent Owner filed a Preliminary Response. Paper 6 ("Prelim. Resp.").

We instituted *inter partes* review of all of the challenged claims of the '494 patent on all of the grounds raised in the Petition. Paper 7 ("Dec. on Inst."), 6–7, 44. Patent Owner filed a Response to the Petition. Paper 14 ("PO Resp."). The Response is supported by the Declaration of Professor George N. Rouskas, Ph.D. (Ex. 2002) and the Declaration of Michael S. Borella (Ex. 2010). Petitioner filed a Reply to Patent Owner's Response. Paper 17 ("Pet. Reply"). The Reply is supported by an additional Declaration of David Goldschlag, Ph.D. (Ex. 1022). Patent Owner filed a Sur-Reply to Petitioner's Reply. Paper 24 ("PO Sur-Reply").

An oral hearing was held on August 11, 2020. A transcript of the oral hearing is included in the record. Paper 25 ("Tr.").

B. Related Matter

The parties identify *MPH Techs. Oy v. Apple Inc.*, Case No. 4:18-cv-05935-PJH (N.D. Cal.), as a matter that may affect or would be affected by a decision in this proceeding. Pet. 2; Paper 4, 1. The parties also identify as related matters the following *inter partes* reviews: IPR2019-00822, IPR2019-00824, IPR2019-00825, and IPR2019-00826, which involve the parties and patents related to the '494 patent. Pet. 2; Paper 4, 1.

C. The Challenged Patent (Ex. 1001)

The '494 patent relates to the "secure forwarding of a message from a first computer to a second computer via an intermediate computer in a telecommunication network." Ex. 1001, 6:38–41. According to the '494 patent, "[a]n essential idea of [its] invention is to use the standard [Internet Protocol ('IP') Security ('IPSec')] protocol . . . between the intermediate computer and the second computer and an 'enhanced IPSec protocol' between the first computer and the intermediate computer." *Id.* at 7:38–41, 1:54. More specifically, the '494 patent states that "[t]he advantage of [its] invention is that [a] logical IPSec connection shared by the first and the second computer can be enhanced by the first and the intermediate computer without involvement of the second computer." *Id.* at 10:38–41. The '494 patent adds: "[i]n particular[,] the so-called 'ingress filtering' performed by some routers [(e.g., the second computer)] does not pose any problems when translations of addresses are used." *Id.* at 10:41–44.

Figure 1, shown below, "illustrates an example of a telecommunication network of the invention" of the '494 patent. *Id.* at 9:55–56.

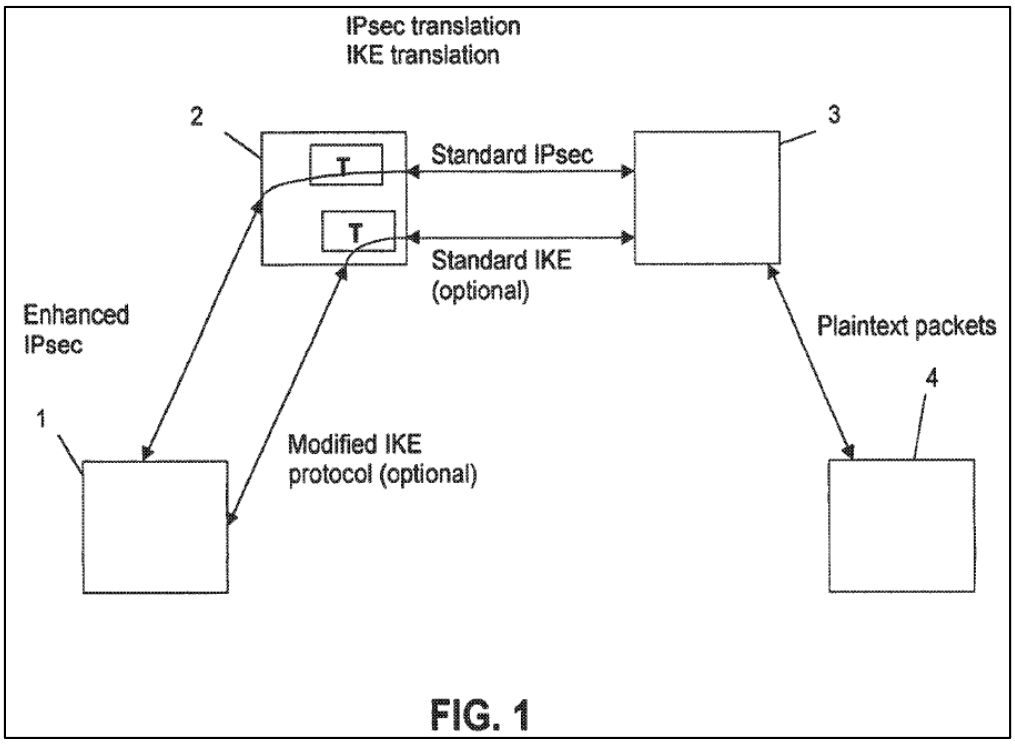

FIG. 1

Figure 1 shows an example of a telecommunication network in accordance with the invention of the '494 patent. *Id.* at 10:4–5. As illustrated, the network comprises: (i) a first computer (client computer 1) that is served by (ii) an intermediate computer (server 2), and (iii) host computer 4 that is served by (iv) a second computer (security gateway 3). *Id.* at 10:4–9. Security gateway 3 "supports the standard IPSec protocol," while client computer 1 and server 2 support an enhanced IPSec protocol. *Id.* at 10:9–12. The '494 patent discloses that the first computer (i.e., client computer 1) in Figure 1 is a mobile terminal. *Id.* at 11:5–7, 11:13–14.

"In the example of F[igure] 1, an IPSec connection is formed between . . . client computer 1 (the first computer) and . . . security gateway 3 (the second computer)." *Id.* at 10:46–48. The '494 patent discloses that

"[m]essages to be sent to . . . host terminal 4 from . . . client computer 1 are first sent to . . . server 2, wherein an IPSec translation[, *inter alia*,] . . . takes place." *Id.* at 10:60–62. Put differently, "[w]hen the intermediate computer receives the packet sent . . ., it performs an address and [Security Parameters Index ('SPI')] translation, ensuring that the security gateway (host 3 of F[igure] 1) can accept the packet." *Id.* at 12:1–4, 2:40–41. The '494 patent states that "translation[s can be] . . . performed[, for example,] by means of a translation table stored at the intermediate computer[,with t]he outer IP header address fields and/or the SPI-values [being] changed by the intermediate computer so that the message can be forwarded to the second computer." *Id.* at 7:46–50.

According to the '494 patent, "[m]ost of the packet is secured using IPSec, . . . [but] the intermediate computer . . . is able to use the outer IP addresses and the incoming SPI value to determine how to modify the outer address and the SPI to suite the second computer, which is the next destination." *Id.* at 12:1–11. "[T]he confidentiality of the packets is not compromised, . . . [because t]he intermediate computer does not know the cryptographic keys used to encrypt and/or authenticate the packets, and can thus not reveal their contents," according to the '494 patent. *Id.* at 10:26–37. After translation, "the message can be sent to . . . security gateway 3, which sends the message further in plain text to . . . host terminal 4." *Id.* at 10:60–64.

D. The Challenged Claims

Petitioner challenges claims 1–11 of the '494 patent, of which claim 1 is the sole independent claim. Claim 1 is illustrative of the challenged claims and is reproduced below:

> 1. An intermediate computer for secure forwarding of messages in a telecommunication network, comprising:
>
> an intermediate computer configured to connect to a telecommunication network;
>
> the intermediate computer configured to be assigned with a first network address in the telecommunication network;
>
> the intermediate computer configured to receive from a mobile computer a secure message sent to the first network address having an encrypted data payload of a message and a unique identity, the data payload encrypted with a cryptographic key derived from a key exchange protocol;
>
> the intermediate computer configured to read the unique identity from the secure message sent to the first network address; and
>
> the intermediate computer configured to access a translation table, to find a destination address from the translation table using the unique identity, and
>
> to securely forward the encrypted data payload to the destination address using a network address of the intermediate computer as a source address of a forwarded message containing the encrypted data payload wherein the intermediate computer does not have the cryptographic key to decrypt the encrypted data payload.

Ex. 1001, 22:40–65.

E. Instituted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability, which are all the grounds of unpatentability raised in the Petition:

	References	35 U.S.C. §[1]	Challenged Claims
1.	Request for Comments 3104 ("RFC3104"),[2] Grabelsky[3]	103(a)	1–5, 8–11
2.	RFC3104, Grabelsky, Wagner[4]	103(a)	6, 7

Pet. 7–8, 20–64.

III. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995)

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[1] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the '494 patent issued from an application having an effective filing date before March 16, 2013, we apply the pre-AIA version of the statutory basis for unpatentability.

[2] G. Montenegro & M. Borella, *RSIP Support for End-to-end IPsec*, Request for Comments 3104, The Internet Society (Oct. 2001) ("RFC3104") (Ex. 1004).

[3] U.S. Patent No. 7,032,242 B1 (issued Apr. 18, 2006) (Ex. 1006).

[4] David Wagner & Bruce Schneier, *Analysis of the SSL 3.0 Protocol*, Proc. 2d USENIX Workshop on Elec. Com. (Nov. 1996) ("Wagner") (Ex. 1007).

(citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). "[O]ne or more factors may predominate." *Id.*

In our Decision on Institution, we adopted Petitioner's proposed definition for one having ordinary skill in the art at the time of the invention of the '494 patent as one who would have had "a Bachelor's (B.S.) degree in Computer Science, Computer Engineering, Electrical Engineering, or an equivalent field, as well as at least 2–5 years of academic or industry experience in the field of Internet security." Dec. on Inst. 7–8 (citing Pet. 17; Ex. 1002 ¶¶ 31–32). Patent Owner does not dispute our adoption of Petitioner's definition, nor otherwise address the level of ordinary skill at the time of the invention of the '494 patent. *See generally* PO Resp.; *see also* Ex. 2002 ¶ 22.

Because Petitioner's definition of the level of skill in the art is consistent with the '494 patent and the asserted prior art, we maintain Petitioner's definition for purposes of this Final Written Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). We apply Petitioner's definition in our analysis below.

IV. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we construe the challenged claims by applying "the standard used in federal courts, in other words, the claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b), which is articulated in *Phillips* [*v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc)]." *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340,

51,340, 51,358 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. § 42.100(b) (2019)). Under *Phillips*, the words of a claim are generally given their "ordinary and customary meaning," which is the meaning they would have to a person of ordinary skill in the art at the time of the invention, in light of the specification and prosecution history. *See Phillips*, 415 F.3d at 1312–13.

Petitioner identifies for construction the term "unique identity," as recited in claim 1. Pet. 18–20. Patent Owner identifies for construction the term (i) "mobile computer," as recited in claim 1; and (ii) "substitute," as recited in dependent claim 2. PO Resp. 10–20. We address these three terms below.

A. Unique Identity

In the Petition, Petitioner argues that "unique identity" means "one or more parameters that uniquely identify a secure connection." Pet. 18. In our Decision on Institution, "we concluded that no express claim construction of the term 'unique identity' [wa]s necessary" because in its Preliminary Response "Patent Owner d[id] not argue that RFC3104 or Grabelsky fails to disclose this term and, therefore, this term is not in controversy." Dec. on Inst. 9 (citations omitted). In the subsequent papers, the parties confirm "that there is no reason to construe this term" because "Patent Owner does not dispute that some form of a unique identity is found in the primary reference." PO Resp. 20; *see also* Pet. Reply 8 (agreeing that this term need not be construed). Accordingly, we find that no express construction of "unique identity" is needed. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) ("[W]e need

only construe terms 'that are in controversy, and only to the extent necessary to resolve the controversy.'").

B. Mobile Computer

Patent Owner argues that "the term 'mobile computer' in the claims means 'a computer that moves from one network to another as opposed to a computer that is only capable of a static secure connection.'" PO Resp. 10. Patent Owner adds that a "mobile computer must be moving between networks," and that "[m]erely being *capable of* moving is insufficient." PO Sur-Reply 5. Petitioner argues that "[t]o the extent the Board determines this term needs to be construed" it means "a computer that is capable of moving between networks or physical locations." Pet. Reply 2.

We address the parties' arguments below as they relate to (i) the claim language, (ii) the '494 patent's Specification, and (iv) the extrinsic evidence.

1. Claim Language

a. Claim 1's Language

Patent Owner argues that claim 1 recites a "'mobile computer' in a specific context." PO Sur-Reply 4. To that end, Patent Owner argues that claim 1 recites:

> "An intermediate computer for secure forwarding of messages in a telecommunication network" including:
> - "the intermediate computer configured to receive from *a mobile computer* a secure message sent to the first network address"
> - "the intermediate computer configured to read the unique identity from the secure message sent to the first network address [from the mobile computer] . . . and to securely forward . . . [a] . . . message containing the encrypted data payload."

PO Resp. 10–11 (quoting Ex. 1001, 22:40–65) (emphasis added). In its Sur-Reply, Patent Owner quotes additional language recited in claim 1, namely that:

> the "mobile computer" sends a "secure message . . . to the first network address having an encrypted data payload of a message and a unique identity, the data payload encrypted with a cryptographic key derived from a key exchange protocol," where an intermediate computer assigned with the first network address in a telecommunications network "securely forward[s] the encrypted data payload to the destination address using a network address of the intermediate computer as a source address of a forwarded message containing the encrypted data payload."

PO Sur-Reply 4–5 (quoting Ex. 1001, 22:40–65). Patent Owner argues that "[i]t is not enough that the computer be capable of moving between networks in some other context at some other time," and that "[t]he mobile computer must be moving between networks in the recited context" of claim 1. *Id.* at 5.

We disagree with Patent Owner that the language of claim 1 supports its proposed construction. Nothing in claim 1 relates to a mobile computer moving between networks. Ex. 1001, 22:40–65. Rather, claim 1 focuses on the operations of "[a]n intermediate computer for secure forwarding of messages in a telecommunication network." *Id.* at 22:40–41 (reciting claim 1's preamble). Each of claim 1's limitations begins with "the intermediate computer configured to," followed by specific operations (i.e., "connect," "be assigned," "receive," "read," and "access and securely forward"). *Id.* at 22:42–65. Moreover, "mobile computer" is recited only once in claim 1, and in context, is merely the device from which the intermediate computer receives a secure message. *Id.*

b. Claim 9's Language

Claim 9 depends from claim 1, and recites "wherein the intermediate computer is configured to modify the translation table entry address fields in response to a signaling message sent from the mobile computer *when the mobile computer changes its address* such that the intermediate computer can know that the address of the mobile computer is changed." Ex. 1001, 24:7–13 (emphasis added). In our Decision on Institution, we noted that in its Preliminary Response, Patent Owner did not address the impact, if any, of dependent claim 9's claim language on the construction Patent Owner proposed for this term at that time. Dec. on Inst. 11. Thereafter, in its Response, Patent Owner addresses claim 9 with respect to its new proposed construction for this term. PO Resp. 11–12.

Patent Owner argues that "[c]laim 9 is consistent with [its] proposed construction." *Id.* at 11. In particular, Patent Owner argues that "[c]laim 9 recites a very specific configuration of the intermediate computer to modify the recited translation table entry address fields in response to a signaling message sent from the mobile computer to provide its new IP address when it has changed networks." *Id.* According to Patent Owner, one of ordinary skill in the art also "would readily recognize that there are other ways by which mobility could be provided in claim 1 using different operations different from those in claim 9." *Id.*

We disagree with Patent Owner that claim 9 is consistent with its proposed construction for this term. Rather, claim 9 adds additional functionality to the intermediate computer (i.e., "modify the translation table") for use "in response to a signaling message sent from the mobile computer *when the mobile computer changes its address*." Ex. 1001, 24:7–

13 (emphasis added). In other words, claim 9 adds functionality to claim 1 for "when" the mobile computer changes addresses (in other words, moves from one network to another). *Id.* Rather than supporting Patent Owner's proposed construction, the language of claim 9 supports Petitioner's proposed construction that a mobile computer "is capable of moving between networks" because claim 9's additional functionality at least suggests that this functionality (including mobile computer movement) is not present in claim 1, which is broader than dependent claim 9. *See Phillips*, 415 F.3d at 1315 ("[T]he presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim."); *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004) ("[W]here the limitation that is sought to be 'read into' an independent claim already appears in a dependent claim, the doctrine of claim differentiation is at its strongest.") (citation omitted). Moreover, we do not find that Patent Owner's arguments, which we discuss below, concerning the Specification's disclosure overcome this presumption.

2. Specification

a. Patent Owner's Arguments

Patent Owner argues that the '494 patent's Specification "describes 'mobility' in the background section" in a way that "is consistent with the understanding that a 'mobile computer' at least moves from one network to another." PO Resp. 12 (citing Ex. 1001, 4:34–38). More specifically, Patent Owner argues that the Specification states that "[i]n this text, the term mobility and mobile terminal does not only mean physical mobility, instead the term mobility is in the first hand meant moving from one network to

another, which can be performed by a physically fixed terminal as well." *Id.* (quoting Ex. 1001, 4:34–38); PO Sur-Reply 3. Patent Owner argues that the plain import of this sentence "is that a requirement of mobility is that the computer is 'moving from one network to another.'" PO Sur-Reply 3.

In addition, Patent Owner argues that "the Background of the Invention [section of the '494 patent] criticizes systems where the host computer is only capable of a static or fixed connection." PO Resp. 13 (citing Ex. 1001, 4:15–27, 4:42–45). Put differently, Patent Owner argues that "[t]he background section of the ['494 [p]atent consistently disparages secure connection systems where the computer is not moving from one network to another and instead are capable of only static secure connections." PO Sur-Reply 3–4 (citing PO Resp. 12–14 (citing Ex. 2002 ¶ 83; Ex. 1001, 4:15–27, 4:42–45, 4:60–64)); *see also* PO Resp. 12–14 (citing same). Patent Owner argues that "[t]hus, the mobile computer is explicitly described as one that is not fixed to a static secure connection (its home address) but is instead moving between networks." PO Sur-Reply 4. Patent Owner argues that this is confirmed by the '494 patent's disclosure that "[t]he mobile terminal is mobile in the sense that it changes its network point of attachment frequently." *Id.* (quoting Ex. 1001, 4:50–51).

In addition, Patent Owner argues that "the Detailed Description of the invention [section] describes mobile computers as being devices that are **not** limited to a static or fixed connection." PO Resp. 14. In support of this argument, Patent Owner block quotes from the Detailed Description section of the '494 patent, without further explanation. *Id.* at 14–16 (quoting Ex. 1001, 7:56–8:10, 11:5–29). The quoted passages generally disclose, *inter alia*, that a first computer (e.g., a mobile computer) can send a signal (e.g., a

registration request) to an intermediate computer so that address fields in a translation table can be modified to account for the change of addresses for enabling mobility. *Id.* Patent Owner then argues that "[t]hus, the mobile computer 1 in Figure 1 of the patent is described as *maintaining* an IPSec connection through second computer 3 because the mobile computer is not restricted to a static or fixed address." *Id.* at 16 (annotating Ex. 1001, Fig. 1) (emphasis added). Similarly, Patent Owner argued, during the oral hearing, that a computer "is functioning as a mobile computer insofar [as] it is moving from one network to another and maintaining, *the key is that it's maintaining the same secure connection*" — "it's moved from one network to another and ha[s] a different address, but it doesn't have to establish a new secure connection." Tr. 49:14–19 (emphasis added).

In addition, Patent Owner argues that its proposed construction is consistent with the '494 "patent's stated purpose: to securely forward a secure message when a computer is mobile, rather than merely when it is fixed to a certain network." PO Sur-Reply 5 (citing Ex. 1001, 4:17–38, 7:56–61).

Lastly, Patent Owner discounts Petitioner's reliance on the background section's discussion of a mobile terminal and a mobile host allegedly forming static secure connections, and instead Patent Owner argues that its proposed construction "is informed by fundamental aspects of the [S]pecification," namely (i) that "the background section of the ['494 [p]atent consistently disparages secure connections where the mobile device is confined to a static secure connection," and (ii) "the detailed description section of the ['494 [p]atent consistently describes a mobile computer as

moving from one network to another and thereby is not limited to a static secure connection." *Id.* at 6.

b. Petitioner's Arguments

Petitioner argues that Patent Owner's proposed construction is "an improper and overly narrow construction of the term 'mobile computer' which attempts to import numerous additional requirements into this basic term." Pet. Reply 1. More specifically, Petitioner argues that Patent Owner's proposed construction "imports essentially the same additional requirements into the claims that the Board already rejected at institution, namely that the 'mobile computer' must be able to move *while maintaining its secure connection*." *Id.* at 2 (citing Dec. on Inst. 10–11).

Petitioner also argues that the Specification refers to "mobile terminal" and "mobile host" as "computers that only establish a 'static secure connection.'" *Id.* at 5. For example, Petitioner argues that the Specification discloses that because "IPSec connections are bound to fixed addresses, the mobile terminal must establish a new IPSec connection from each point of attachment." *Id.* at 6 (citing PO Resp. 14 (quoting Ex. 1001, 4:60–64)) (emphasis omitted). For another example, Petitioner argues that the Specification states that "IPSec is intended to work with static network topology, where hosts are fixed to certain subnetworks," and "[i]f IPSec is used with a ***mobile host***, the IKE key exchange *will have to be redone from every new visited network*." *Id.* (citing PO Resp. 13 (quoting Ex. 1001, 4:16–18, 4:21–23)). Petitioner argues that "this passage plainly uses the term 'mobile host' in conjunction with a computer reestablishing static IPSec connections when moving rather than maintaining them." *Id.* (citation omitted).

c. Our Analysis

We disagree with Patent Owner that the cited portions of the Specification support its proposed construction for this term. First, we find that Patent Owner conflates "mobility" with "mobile computer."[5] The Specification states that "the term *mobility* . . . meant moving from one network to another," rather than the term "mobile computer" having this meaning. Ex. 1001, 4:34–38 (emphasis added). Moreover, the Specification uses the term "mobility" as a capability or condition. For example, the Specification uses the term "mobility" as follows: (i) certain "protocols are not well suited to *mobility*"; (ii) "[t]he intermediate host might be a Mobile IP home agent, that provides *mobility* for the connection between the mobile terminal and the home agent . . . ."; (iii) a disclosed "method solves the *mobility* problem, at the cost of adding extra headers to packets"; and (iv) "[o]ne example of a change in the [security association ('SA')] between the first computer and the intermediate computer is the change of addresses for enabling *mobility*." Ex. 1001, 5:7–8, 5:17–21, 5:33–34, 7:56–58 (emphases added). In other words, mobility is a capability a mobile computer has, rather than being synonymous with mobile computer. As such, these passages from the Specification support Petitioner's construction

[5] Patent Owner likewise argues that we concluded in our Decision on Institution that a "'mobile computer' must at least be 'moving from one network to another.'" PO Sur-Reply 2 (quoting Dec. on Inst. 10). This is incorrect. Instead, we found "that the '494 patent teaches that *mobility* 'mean[s] moving from one network to another.'" Dec. on Inst. 10 (quoting Ex. 1001, 4:34–37) (emphasis added). We also expressly stated that we did not reach "whether 'a computer that is capable of moving from one network to another' differs from the plain meaning of 'mobile computer,' as this [wa]s not in controversy" at the institution stage. *Id.*

that a mobile computer is "a computer that is capable of moving between networks," rather than Patent Owner's construction requiring that a "mobile computer must be moving between networks."

Second, we are not persuaded by Patent Owner's arguments that the '494 patent's background section criticizes and disparages systems where the host computers are only capable of a static or fixed connection. PO Resp. 13–14. These host computers are not mobile computers, but rather "are fixed to certain subnetworks." Ex. 1001, 4:16–18. Put differently, for these hosts "when an IPSec tunnel has been formed by using Internet Key Exchange (IKE) protocol, the tunnel endpoints are fixed and remain constant." *Id.* at 4:18–21. In contrast, a mobile computer has the capability to move between networks (i.e., can change its network point of attachment frequently). *See* Ex. 1001, 4:50–53 ("The mobile terminal is mobile in the sense that it changes its network point of attachment frequently."). The Specification makes clear that a mobile computer is capable of moving between networks (as opposed to requiring such movement), even if it would have to "establish a new IPSec connection from each point of attachment," or put differently, "the IKE key exchange *will have to be redone from every new visited network*." Ex. 1001, 4:21–23, 4:60–63. Hence, Patent Owner's construction also is incorrect to the extent that the latter portion (i.e., "as opposed to a computer that is only capable of a static secure connection") would exclude a mobile computer from establishing a secure connection (static or otherwise) from each point of attachment. Ex. 1001, 4:50–53, 4:60–63.

Third, we find that Patent Owner's proposed construction is unworkable as to when such alleged movement needs to have occurred.

Patent Owner agrees that "[c]ertainly the computer is at times going to be connected to a given network because it establishes a secure connection with a given network." Tr. 49:12–14. Despite this, Patent Owner argues that the proper construction for this term requires that a mobile computer must be moving between networks. *E.g.*, *id.* at 49:14–16. However, whether or not the mobile computer has changed its point of attachment and established a new IPSec connection before sending a secure message to the intermediate computer is immaterial to claim 1's limitations. Ex. 1001, 4:15–27, 4:60–64, 22:40–65. Again, the mobile computer in claim 1 simply sends a secure message to the intermediate computer from a point of attachment to the network — no movement is required. *Id.* at 22:40–65. Claim 1 is focused on the operations of the intermediate computer, and in particular, that the immediate computer uses, *inter alia*, a translation table and unique identity to forward a secure message without the intermediate computer having the cryptographic key to decrypt the encrypted data payload. *Id.*

Fourth, we are not persuaded by Patent Owner's argument that its proposed construction is consistent with the '494 patent's "stated purpose." PO Sur-Reply 4. The portions of the Specification that Patent Owner cites do not purport any "stated purpose," but rather relate to additional functionality to handle, *inter alia*, addressing when a mobile computer moves networks. Ex. 1001, 4:17–38, 7:56–61. This functionality is implicated in claim 9, but not claim 1. *Compare id.* at 22:40–65, *with id.* at 24:7–13; *see also Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008) ("It is often the case that different claims are directed to and cover different disclosed embodiments."). We also note that the '494 patent's Abstract does not relate to mobility, but instead relates to

the subject matter of claim 1, including that an intermediate computer uses a message's destination address and a unique identity to find an address to a second computer, and substitutes these values with the found address and another unique identity, before forwarding the message to the second computer. Ex. 1001, code (57).

Fifth, we find inapposite Patent Owner's arguments that a mobile computer moves from one network to another, *maintaining the same secure connection*.[6] *E.g.*, PO Resp. 16; Tr. 49:14–19. Simply put, maintaining the same secure connection is not part of Patent Owner's proposed construction. PO Resp. 10. Nor is it warranted by the claim language or Specification, as we discuss above. *See supra*. The '494 patent's Specification clearly describes the concept of a mobile terminal having the capability to move between networks (and establish secure connections while at a network). *E.g.*, Ex. 1001, 4:21–23, 4:34–38, 4:50–52. The Specification also provides additional disclosed functionality to handle addressing for a secure connection when a mobile terminal moves. Ex. 1001, 7:38–8:10. It is this additional functionality (such as recited in claim 9) that Patent Owner cites from the detailed description section of the '494 patent, but there is no justification in the intrinsic evidence to import these additional features into the term "mobile computer." *See Baran v. Medical Device Techs.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010) ("It is not necessary that each claim read on

[6] Patent Owner's proposed construction for "mobile computer" from its Preliminary Response was "a computer that is capable of moving from one network to another while maintaining a connection." Prelim. Resp. 6. We did not adopt that proposed construction. Dec. on Inst. 10–11. Patent Owner's new proposed construction does not include "while maintaining a connection." PO Resp. 10.

every embodiment."); *Helmsderfer*, 527 F.3d at 1383. "It is long settled that even though 'claims must be read in light of the specification of which they are a part, it is improper to read limitations from the written description into a claim.'" *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019) (quoting *Wenger Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1237 (Fed. Cir. 2001)).

Lastly, we find that Patent Owner raised for the first time during the oral hearing the issue of disavowal of claim scope for the term "mobile computer," and cited to cases that were nowhere in the papers. Tr. 53:6–55:16. A new argument may not be raised during the oral hearing because Petitioner has no effective opportunity to review the argument and respond. *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide 85 ("Consolidated Practice Guide") (Nov. 2019) (available at https://www.uspto.gov/TrialPracticeGuideConsolidated) ("During an oral hearing, a party may rely upon appropriate demonstrative exhibits as well as evidence that has been previously submitted in the proceeding, but may only present arguments relied upon in the papers previously submitted."); *see also Dell Inc. v. Acceleron, LLC*, 884 F.3d 1364, 1369 (Fed. Cir. 2018) (holding that the Board was not obligated to consider an "untimely argument . . . raised for the first time during oral argument"); Paper 8 (Scheduling Order), 7 ("Patent Owner is cautioned that any arguments not raised in the response may be deemed waived."). Accordingly, we do not consider this argument.

3. Extrinsic Evidence

The parties cite to declarations of their experts in support of their proposed constructions. *E.g.*, PO Resp. 16 (citing Ex. 2002 ¶¶ 78–85); Pet.

Reply 3–8 (citing Ex. 1022 ¶¶ 7–16); PO Sur-Reply 2–10. Likewise, the parties cite to the deposition testimony of the parties' experts to argue for their proposed constructions. *See generally* PO Resp.; Pet. Reply; PO Sur-Reply.

We reviewed the cited expert testimony, and we find it of little help. "Although expert testimony and declarations are useful to confirm that the construed meaning is consistent with the denotation ascribed by those in the field of the art, . . . such extrinsic evidence cannot be used to vary the plain language of the patent document." *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1332 (Fed. Cir. 2003) (citing *Pitney Bowes, Inc. v. Hewlett–Packard Co.*, 182 F.3d 1298, 1309 (Fed. Cir. 1999) & *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 (Fed. Cir. 1996)). As we discuss above, we find that the intrinsic evidence provides that the plain and ordinary meaning of "mobile computer" to one of ordinary skill in the art, in view of the Specification, covers a computer that is capable of moving between networks. *See Supra* Section IV(B)(1)–(2). Accordingly, to the extent that the experts' testimony is contrary to this conclusion, we give it no weight. *See Phillips*, 415 F.3d at 1318 (stating that "a court should discount any expert testimony 'that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.'") (citation omitted).

Lastly, we note that the dictionary definition for "mobile" offered by Petitioner's expert, Dr. Goldschlag, is consistent with the meaning of mobile computer provided by the intrinsic evidence. Ex. 1022 ¶ 9. Namely,

Merriam-Webster[7] defines "mobile" as "capable of moving or being moved." *Id.* (quoting Ex. 1025, 797).

In summary, we have reviewed the parties' submitted extrinsic evidence, but we give it little weight in light of the clear language of the intrinsic evidence. *See Wi-LAN, Inc. v. Apple Inc.*, 811 F.3d 455, 462 (Fed. Cir. 2016) (finding extrinsic evidence "is generally of less significance than the intrinsic record" in matters of claim construction); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (finding that when "an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term[,] . . . it is improper to rely on extrinsic evidence").

4. Summary

Based on our review of the parties' arguments and the evidence of record, we agree with Petitioner[8] and conclude that "mobile computer" covers "a computer that is capable of moving between networks."

C. Substitute

Patent Owner argues that "[t]he term 'substitute' means 'changing, replacing, or modifying, not merely adding to.'" PO Resp. 17. Petitioner argues that this term does not "need[] to be expressly construed for purposes of this proceeding." Pet. Reply 8. We disagree with Petitioner, as the

[7] Merriam-Webster's Collegiate Dictionary, Eleventh Edition (2003).
[8] Petitioner's proposed construction for this term is "a computer that is capable of moving between networks *or physical locations*." Pet. Reply 2 (emphasis added). To resolve the parties' disputes, we need not, and thus do not, reach whether being capable of moving between physical locations should be included within the meaning of mobile computer. *See Nidec*, 868 F.3d at 1017.

dispute between the parties for dependent claim 2 turns on the construction of this term. *See* Pet. 50–52; PO Resp. 52–58.

Patent Owner argues in its briefing that in addition to the plain language of the claim, the Specification of the '494 patent supports its proposed construction. PO Resp. 17–20. Patent Owner directs attention to the portion of the '494 patent's Specification that describes some modification or replacement of the first address with a new address. *Id.* at 18 (citing Ex. 1001, 7:46–50, 12:4–14, 12:18–22). Conversely, Petitioner argued during the oral hearing that "adding the header is the same as replacing the header because at the end of the day you have a different header than what you had before, a completely different header." Tr. 39:16–19.

We agree with Patent Owner that the cited passages describe modification or replacement and not "adding to." Ex. 1001, 7:46–50, 12:4–14, 12:18–22. We further agree that the Specification of the '494 patent distinguishes between adding and substituting. PO Resp. 19 (citing Ex. 1001, 5:33–36, 10:29–34, 16:37–45).

Accordingly, we construe "substitute" to mean "changing, replacing, or modifying, not merely adding to."

V. PRINCIPLES OF LAW

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of

the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present.[9] *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must "determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

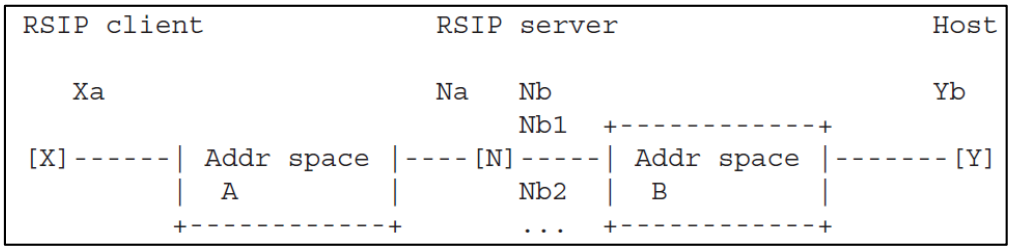
VI. ALLEGED OBVIOUSNESS OVER RFC3104 AND GRABELSKY

Petitioner argues that the combination of RFC3104 and Grabelsky renders claims 1–5 and 8–11 of the '494 patent obvious under 35 U.S.C. § 103(a). Pet. 20–58. We have reviewed the parties' arguments and the evidence of record. For the reasons that follow, we determine that Petitioner (1) shows by a preponderance of the evidence that claims 1, 3, 5, 8, and 10 would have been obvious to one of ordinary skill in the art in view of RFC3104 and Grabelsky; and (2) does not show by a preponderance of the evidence that claims 2, 4, 9, and 11 would have been obvious to one of ordinary skill in the art in view of RFC3104 and Grabelsky.

A. Summary of RFC3104

RFC3104 "proposes mechanisms to handle," and "specifies RSIP extensions to enable," end-to-end IPSec. Ex. 1004, 1–2. A figure, shown below, appearing on page 2 of RFC3104 illustrates a "model" topology, in accordance with RFC3104's teachings. *Id.* at 2.

[9] Patent Owner does not present arguments or evidence of such objective evidence of non-obviousness in its Response. *See generally* PO Resp.



RFC3104 provides the above illustrated "model" topology "[f]or clarity" in discussing its teachings. *Id.* As shown, "[h]osts X and Y belong to different address spaces A and B, respectively, and N is an [intermediate] RSIP server." *Id.* at 3. RFC3104 teaches that "N has two addresses: Na on address space A, and Nb on address space B. For example, A could be a private address space, and B the public address space of the general Internet." *Id.*

RFC3104 enables "RSIP client X to initiate . . . IP[S]ec sessions to a legacy . . . IP[S]ec node Y." *Id.* at 3. To that end, RFC3104 teaches that "RSIP client X and server N must arrive at an SPI value to denote the incoming IP[S]ec security association from Y to X." *Id.* at 5. RFC3104 adds: "Once N and X make sure that the SPI is unique within both of their SPI spaces, X communicates its value to Y as part of the IP[S]ec [SA] . . . establishment process." *Id.* According to RFC3104, "[t]his ensures that Y sends IP[S]ec packets . . . to X via address Nb using the negotiated SPI." *Id.* In such a scenario, "IP[S]ec packets from Y destined for X arrive at RSIP server N." *Id.* "RSIP server N . . . examin[es the] packet[s] sent by Y, destined for X[, which] . . . implies that 'source' refers to Y and 'destination' refers to Y's peer, namely, X's presence at N." *Id.* at 3. N demultiplexes each of the IPSec packets "based on the following minimum tuple of demultiplexing fields:" protocol, SPI, and destination IP address. *Id.* at 5. RFC3104 teaches that "[i]f N is able to find a matching mapping, it tunnels

the packet to X according to the tunneling mode in effect." *Id.* Otherwise, RFC3104 teaches that "N . . . MUST discard the packet." *Id.*

B. Summary of Grabelsky

Grabelsky relates to allowing IPSec "to be used with distributed network address translation . . . by mapping a local . . . [IP] address of a given local network device and a IP[S]ec . . . [SPI] associated with an inbound IP[S]sec [SA] . . . that terminates at the local network device." Ex. 1006, code (57). "A router allocates locally unique security values that are used as the IP[S]ec SPIs." *Id.* Figure 21, shown below, "is a block diagram illustrating a SPI-to-internal network address table layout." *Id.* at 6:13–14.

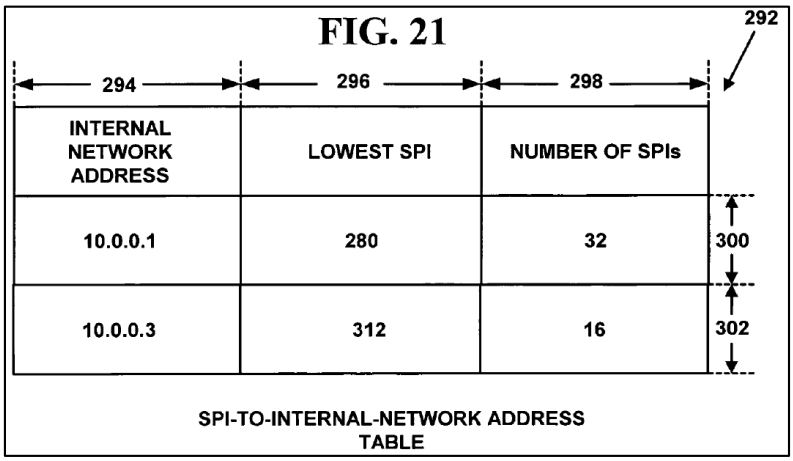


Figure 21, shown above, illustrates "a SPI-to-internal network address table," in accordance with Grabelsky's teachings. *Id.* at 27:56–57. Grabelsky teaches that "a network address for [a] first network device is stored with . . . one or more locally unique security values in a table [(e.g., the table of Figure 21)] associated with [a] second network device." *Id.* at 27:21–24, 27:56–58. Grabelsky teaches that "[t]he table is used to maintain a mapping between a network device and a locally unique security value for distributed network address translation with security." *Id.* at 27:24–27.

In accordance with Grabelsky's teachings, for incoming packets using IPSec, the router (which routes data packets to another external computer network) maintains a mapping between local IP addresses of network devices and SPI values. *Id.* at 6:34–35, 32:32–34. Grabelsky teaches that when an IPSec packet arrives on the router, the router examines a SPI value in the IPSec packet's outermost header, which is typically visible. *Id.* at 32:35–39. "The SPI value in the IP[S]ec header is used to determine a local IP address of a destination network device," according to Grabelsky's teachings. *Id.* at 32:39–41.

C. Challenged Claim 1

1. Undisputed Limitations

a. Intermediate Computer for Secure Forwarding

Petitioner argues that RFC3104 discloses "[a]n intermediate computer for secure forwarding of messages in a telecommunication network," as recited in claim 1's preamble. Pet. 28–30. More specifically, Petitioner argues that RFC3104 discloses "an RSIP server N ('*intermediate computer*') forwarding a message (e.g., data packets) sent from a host Y ('*mobile computer*') to a host X ('*destination*'). *Id.* at 28–29 (citing Ex. 1004, 2; Ex. 1002 ¶ 83). Petitioner argues that "[t]he interconnected computer configuration allowing host Y to communicate with host X via RSIP server N represents a '*telecommunication network*' as recited in the claims." *Id.* at 29 (citing Ex. 1002 ¶ 84). Petitioner also argues that "[a]n IPSec [SA] . . . is established from Y to X." *Id.* (citing Ex. 1004, 5). According to Petitioner, "[o]nce an SA is established, host Y is able to securely send messages to RSIP client X, forwarded through RSIP server N." *Id.* at 30 (citing Ex. 1004, 5; Ex. 1002 ¶ 85).

b. Connect to a Telecommunication Network

Petitioner argues that RFC3104 discloses "an intermediate computer configured to connect to a telecommunication network," as recited in claim 1. *Id.* at 30. More specifically, Petitioner argues that "the mechanisms described in RFC3104 are used . . . within telecommunications networks, for example, private networks and public networks such as the 'Internet.'" *Id.* (citing Ex. 1004, 3; Ex. 1002 ¶ 86).

c. Assigned with a First Network Address

Petitioner argues that RFC3104 discloses that "the intermediate computer [is] configured to be assigned with a first network address in the telecommunication network," as recited in claim 1. *Id.* at 30–31. More specifically, Petitioner argues that "RFC3104 discloses that 'N has two addresses: Na on address space A, and Nb on address space B. For example, A could be a private address space, and B the public address space of the general Internet." *Id.* at 30 (citing Ex. 1004, 3).

d. Receive a Secure Message[10]

Petitioner argues that RFC3104 discloses that "the intermediate computer [is] configured to receive . . . a secure message sent to the first network address having an encrypted data payload of a message and a unique identity, the data payload encrypted with a cryptographic key derived from a key exchange protocol," as recited in claim 1. *Id.* at 31–43. More specifically, Petitioner argues that RFC3104 discloses that an IPSec SA is established from Y to X. *Id.* at 32 (citing Ex. 1004, 5; Ex. 1002 ¶ 89). To

[10] As we discuss below, Patent Owner disputes that the intermediate computer receives the secure message "from a mobile computer." *See infra* Section VI(C)(2).

that end, Petitioner argues that "RFC3104 specifically discloses that 'Y sends IP[S]ec packets (protocols 51 and 50 for AH and ESP, respectively) [] to X *via address Nb*,' and Dr. Goldschlag explains that an IPSec packet is '*a secure message*' because the packet is secured in accordance with IPSec protocols." *Id.* (quoting Ex. 1004, 5; citing Ex. 1002 ¶ 90). Petitioner argues that server N sends the packet (with an address of Na) to host X, and that both Na and Nb are "*network address*[*es*]" of server N. *Id.*

In addition, Petitioner argues that one of ordinary skill in the art "would have understood that an IPSec packet arriving at server N sent from host Y would include a data payload, which is the primary information IPSec is designed to protect," and "that the data payload of the packet sent from Y to X would be encrypted before being sent from Y." *Id.* at 35 (citing Ex. 1017, 8; Ex. 1002 ¶¶ 96–97); *see also id.* at 36 (citing Ex. 1002 ¶¶ 99–101) (arguing that one of ordinary skill in the art "would have understood that in accordance with IPSec standards, the data payload of the packet would be encrypted in order to protect confidentiality of the data"). According to Petitioner, RFC3104 teaches that "[t]he IPSec SA from Y to X is established through use of an Internet Key Exchange (IKE) protocol, 'namely, *Quick Mode in IKE*.'" *Id.* at 36 (quoting Ex. 1004, 5). Petitioner argues that one of ordinary skill in the art "would have understood that the use of 'Quick Mode in IKE' involves exchange of keying information (between X and Y in this case), e.g., Diffie-Hellman key information, used to derive '*cryptographic key*[*s*].'" *Id.* (citing Ex. 1002 ¶ 98 (citing Ex. 1018, 16–19)); *see also id.* (citing Ex. 1004, 3–7) (arguing that "RFC3104 provides further details of IKE support and handling for RSIP").

Lastly, Petitioner argues that the combination of RFC3104 and Grabelsky teaches that the secure message has a unique identity. *Id.* at 37. More specifically, Petitioner argues that the message's "SPI value, the set of 'demultiplexing fields,' and the packet headers [(i.e., the IP header and IPSec protocol header)], each provides a '*unique identity.*'" *E.g.*, *id.* (citing Ex. 1002 ¶ 102); *see also id.* at 37–43 (citing Ex. 1004, 5; Ex. 1006, 20:49–50, 20:63–66, 21:33–37, 22:17–18, 23:5–9, 24:5–8, 24:21–28, Figs. 15–18; Ex. 1002 ¶¶ 103–106, 108–109, 112–113) (arguing that the message has a unique identity).

e. Read the Unique Identity

Petitioner argues that RFC3104 discloses that "the intermediate computer [is] configured to read the unique identity from the secure message sent to the first network address," as recited in claim 1. *Id.* at 44. More specifically, Petitioner argues that RFC3104 discloses a "'*unique identity*' in the form of packet headers (i.e., the IP header and IPSec protocol header) of a packet received by RSIP server N from host Y, which contain a set of 'demultiplexing fields.'" *Id.* (citing Ex. 1004, 5). According to Petitioner, "RFC3104 further discloses that the set of 'demultiplexing fields' is read by RSIP server N (the '*intermediate computer*')." *Id.* (citing Ex. 1002 ¶ 114). In particular, Petitioner argues that RFC3104 discloses that in using the demultiplexing fields, "[i]f N is able to find a matching mapping, it tunnels the packet to X according to the tunneling mode in effect." *Id.* (quoting Ex. 1004, 5; Ex. 1002 ¶ 114). Petitioner argues that one of ordinary skill in the art "would have understood that in order for RSIP server N to search for a 'matching mapping,' server N would need to read the values of the set of 'demultiplexing fields.'" *Id.* (citing Ex. 1002 ¶ 114).

f. Securely Forward the Encrypted Data Payload

Petitioner argues that RFC3104 teaches that "the intermediate computer [is] configured . . . to securely forward the encrypted data payload to the destination address using a network address of the intermediate computer as a source address of a forwarded message containing the encrypted data payload," as recited in claim 1. *Id.* at 46–49. More specifically, Petitioner argues that RFC3104 teaches that "'Y sends IP[S]ec packets [(i.e., "*secure message*")] . . . to X via address Nb using the negotiated SPI,' and each packet includes an '*encrypted data payload*.'" *Id.* at 47 (quoting Ex. 1004, 5). Petitioner argues that RFC3104 teaches that "the secure message will first be sent from host Y to interface Nb at RSIP server N ('*the intermediate computer*')" and that "this secure message would have a source address of Yb." *Id.* (citing Ex. 1004, 2; Ex. 1002 ¶ 119). According to Petitioner, RFC3104 teaches that "[i]f N is able to find a matching mapping, *it tunnels the packet to X* according to the tunneling mode in effect." *Id.* (citing Ex. 1004, 5). Petitioner argues that one of ordinary skill in the art "would have understood that the '*forwarded message containing the encrypted data payload*' sent from RSIP server N to client X would have a source address of Na because the message is being sent from RSIP server N via the Na address using 'address space A' within the private network." *Id.* at 47–48 (citing Ex. 1004, 3; Ex. 1002 ¶ 120). Petitioner argues, thus, "when sending secure messages from Y to X, RFC3104 discloses that '*a network address of the intermediate computer*' (i.e. Na) is used '*as a source address*' by RSIP server N (i.e., *the intermediate computer*) '*to securely forward the encrypted data payload to the*

destination address' (i.e. the client X)." *Id.* at 48 (citing Ex. 1004, 3; Ex. 1002 ¶ 120).

g. Intermediate Computer Does Not Have the Cryptographic Key

Petitioner argues that RFC3104 teaches that "the intermediate computer does not have the cryptographic key to decrypt the encrypted data payload," as recited in claim 1. Pet. 49–50. More specifically, Petitioner argues that RFC3104 teaches that "packets arriving at RSIP server N are demultiplexed based on parameters accessible from the IP header and the IPSec protocol header." *Id.* at 49 (citing Ex. 1004, 5; Ex. 1002 ¶ 123). In addition, Dr. Goldschlag testifies that RFC3104 teaches that "'I[PS]ec packets from Y destined for X arrive at RSIP server N' and 'are demultiplexed based on the following minimum tuple of demultiplexing fields:' 'protocol (50 or 51),' 'SPI,' and 'destination IP address.'" Ex. 1002 ¶ 123 (quoting Ex. 1004, 5).

"Server N then searches for a 'matching mapping' using these fields and forwards the packet to its destination without the need to decrypt any portion of the packet or be aware of any encryption/authentication keys, or establish a new connection," according to Petitioner. Pet. 49–50 (citing Ex. 1004, 5; Ex. 1002 ¶ 123). Dr. Goldschlag testifies that "this is the result of establishing an "IP[S]ec [SA] . . . from Y to X." Ex. 1002 ¶ 123 (quoting Ex. 1004, 5).

h. Our Analysis

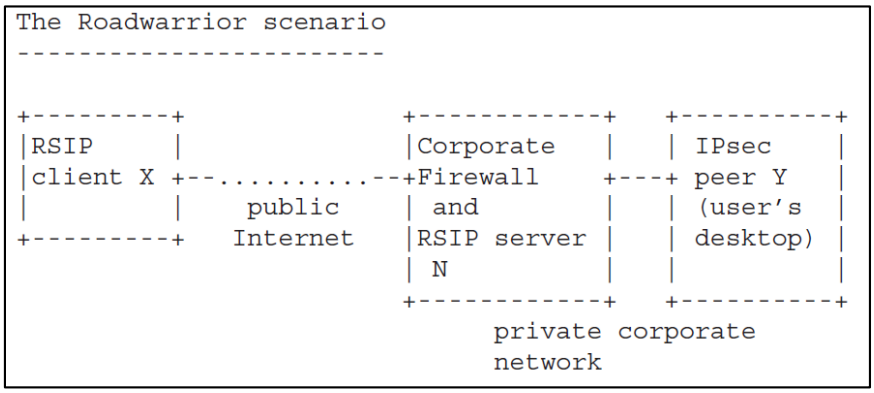
After reviewing Petitioner's arguments and evidence regarding the limitations identified above, which are not addressed by Patent Owner (*see generally* PO Resp.), we are persuaded that Petitioner demonstrates by a

preponderance of the evidence that the combination of RFC3104 and Grabelsky teaches the above identified undisputed limitations.

2. Mobile Computer

We agree with Petitioner that RFC3104 teaches that the intermediate computer is configured to receive "from a mobile computer"[11] a secure message, as recited in claim 1. Pet. 33–35. In particular, RFC3104 discloses specific scenarios in which a host is a mobile computer. Ex. 1004, 3, 16; Pet. 33. For example, RFC3104 discloses the "Roadwarrior scenario." Ex. 1004, 3, 16; Pet. 33.

In the "Roadwarrior scenario," "a remote user with a laptop gains access to the Internet," and "wants to access its corporation['s] private network." Ex. 1004, 16. RFC3104 provides a diagram, shown below, of this scenario. *Id.*



The Roadwarrior scenario diagram, shown above, illustrates an example application of RFC3104's teachings. *Id.* As illustrated, RSIP client X (laptop) is shown as connected to the public Internet, with host Y part of a private corporate network. Ex. 1004, 16; Pet. 34. We agree with Petitioner

[11] The discussion here focuses on "from a mobile computer" as the rest of the limitation is addressed above. *See supra* Section VI(C)(1).

and find that "[b]ecause the user with the laptop is on the road, . . . [one of ordinary skill in the art] would have understood that the laptop would change its point of attachment and its address when connecting to the Internet from different locations." Ex. 1002 ¶ 95; Pet. 34–35; *see also* Ex. 2002 ¶ 97 ("A POSITA would understand that as a computer changes networks it will change IP addresses."). Put differently, the laptop is physically mobile and the term "[r]oadwarrior" at least suggests that the remote user is on the road, changing networks frequently. Ex. 1002 ¶ 95; *see also* Ex. 2002 ¶ 97 ("A POSITA would understand that a businessperson on the road with a laptop can be expected to connect to different networks and have different fixed IP addresses at different points in time."). Hence, we find that RSIP client X, in the Roadwarrior scenario, is a mobile computer (i.e., a computer that is capable of moving between networks). Ex. 1004, 16; Ex. 1002 ¶ 95.

Moreover, we find that client X being a mobile computer connected to the public Internet in the Roadwarrior scenario teaches that host Y in the Model topology also is a mobile computer, as host Y is connected to the public Internet. *Compare* Ex. 1004, 2–3, *with id.* at 16; Ex. 1003 ¶ 93 (opining that at least the computer connected to the public Internet would be a mobile computer).

Regardless, RFC3104 teaches for the Roadwarrior scenario "that RSIP server N 'would use RSIP to selectively enable IP[S]ec traffic between internal and external systems,' thus allowing packets to be sent from RSIP client X to host Y, and vice versa." Pet. 34; Ex. 1004, 16; Ex. 1002 ¶ 94. RFC3104 additionally teaches that the Roadwarrior "scenario could also be reversed in order to allow an internal system (Y) to initiate and establish an

IP[S]ec session with an external IP[S]ec peer (X)." Ex. 1004, 16; Pet 34. This reversed Roadwarrior scenario would mirror the Model topology in that the internal (i.e., private corporate network) system would initiate and establish an IPSec session with an external (public Internet) IPSec peer. Ex. 2004, 2–3, 16. In the context of the reversed Roadwarrior scenario, this teaches a specific scenario in which the external IPSec peer is a mobile computer (i.e., a laptop of a remote user on the road), which further supports that host Y in the Model topology is (or it would be obvious to be) a mobile computer. *Id.* Accordingly, we agree with Petitioner and find that one of ordinary skill in the art "would have . . . understood that either RFC3104's host Y or X could be (and often would be) a '*mobile computer*.'" Ex. 1002 ¶ 91; Pet. 33.

Alternatively, we are persuaded that one of ordinary skill in the art would have found it obvious to have host Y in the Model topology be a mobile computer in view of the Roadwarrior scenario teaching a mobile computer. Ex. 1004, 2–3, 16; Ex. 1002 ¶¶ 91–95; *see also In re Preda*, 401 F.2d 825, 826 (CCPA 1968) ("[I]t is proper to take into account not only specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw therefrom."); *KSR*, 550 U.S. at 417 ("If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.").

We are not persuaded by Patent Owner's argument that "Dr. Goldschlag's testimony should be given little to no weight because it is conclusory, and it fails to provide reasoning linked to an articulated factual basis to support the assertion that RSIP Host X must be a mobile computer because Host X is connected to the public Internet." PO Resp. 34–35 (citing

Ex. 1002 ¶93). Rather, we find that the "public" nature of public Internet factually supports Dr. Goldschlag's testimony that RSIP client X would be a mobile computer, as members of the public would access the public Internet and establish connections from varying public locations. Moreover, we find Dr. Goldschlag's testimony (paragraph 93) states "[i]n this case" and "as discussed in this scenario," which refers back to at least paragraph 92, and he there provides a further rational basis (e.g., that its the Roadwarrior scenario's laptop (a moveable device) which is connected to the public Internet) for at least his opinions in paragraph 93 of his Declaration. Ex. 1002 ¶¶ 92–93. We also find inapposite Patent Owner's argument that "[a] computer can be connected to the public Internet using a fixed IP address." PO Resp. 33 (citing Ex. 2002 ¶ 104). Patent Owner does not address that different fixed addresses would be used if a member of the public establishes connections from varying public locations. *See* Ex. 1002 ¶ 95; Ex. 2002 ¶ 97. And, as the '494 patent's Specification teaches, connections can be made at every newly visited site. Ex. 1001, 4:21–23, 4:50–51.

Lastly,[12] we find that Patent Owner's remaining arguments for this limitation are premised on either its (i) proposed construction (i.e., a mobile computer is "a computer that moves from one network to another as opposed to a computer that is only capable of a static secure connection"), which we do not adopt; or (ii) inapposite argument that the mobile computer needs to

[12] We need not, and thus do not, reach whether Petitioner's arguments for this limitation in its Reply (Pet. Reply 8–14) are new arguments, as Patent Owner argues in its Sur-Reply (PO Sur-Reply 13–24), because we do not rely on them, but instead, we rely on Petitioner's arguments, and citations to the record evidence, from the Petition.

maintain the same secure connection. *See* PO Resp. 25–51. Thus, we find these arguments unavailing. Likewise, Dr. Borella's declaration testimony is not helpful to our analysis as his "declaration employs the assumption that the 'mobile computer' recited in the claims moves from one network to another," which is contrary to our construction, as we discuss above. Ex. 2010 ¶ 42; *supra* Section IV(B) (construing mobile computer).

In summary, we find that RFC3104 teaches that the intermediate computer is configured to receive "from a mobile computer" a secure message, in accordance with claim 1.

3. Access a Translation Table

Petitioner argues that the combination of RFC3104 and Grabelsky teaches that "the intermediate computer [is] configured to access a translation table, to find a destination address from the translation table using the unique identity," as recited in claim 1. Pet. 45–46. More specifically, Petitioner argues that "RFC3104 discloses that packets arriving at RSIP server N from host Y include a 'minimum tuple of demultiplexing fields,' which are part of the '*unique identity*.'" *Id.* at 45 (citing Ex. 1004, 5). Petitioner argues that RFC3104 discloses "[u]sing these fields, '[i]f N is able to find a matching mapping, it tunnels the packet to X according to the tunneling mode in effect.'" *Id.* (quoting Ex. 1004, 5; citing Ex. 1002 ¶ 115).

As to Grabelsky, Petitioner argues that Grabelsky teaches the use of translation tables for mapping. *Id.* (citing Ex. 1006, Fig. 21). More specifically, Petitioner argues that Grabelsky teaches "[f]or incoming packets using IP[S]ec, *the router 26 . . . maintains a mapping (F[igure] 21) between local IP addresses of network devices . . . and SPI values*." *Id.* at 45–46 (quoting Ex. 1006, 32:32–34). Petitioner argues that Grabelsky

teaches that when an IPSec packet arrives at router 26, router 26 examines a SPI value in the IPSec packet's outermost header, which is typically visible. *Id.* at 46 (citing Ex. 1006, 32:35–39). Grabelsky teaches that "[*t*]*he SPI value in the IP[S]ec header is used to determine a local IP 54 address of a destination network device*," according to Petitioner. *Id.* (quoting Ex. 1006, 32:39–41).

Petitioner argues that one of ordinary skill in the art "would have been motivated to seek out Grabelsky for viable implementation details for the mapping mechanism at RSIP server N in RFC3104." *Id.* (citing Ex. 1002 ¶ 118). "RFC3104 already discloses a 'mapping' of the 'minimum tuple of demultiplexing fields' to a destination (e.g., the destination address of RSIP client X)," according to Petitioner. *Id.* (citing Ex. 1004, 5; Ex. 1002 ¶ 118). Petitioner argues thus "[t]he combination would amount to nothing more than combining known elements to yield predictable results, namely a translation table as in Grabelsky mapping the 'demultiplexing fields' of RFC3104 to the destination address of the IPSec SA." *Id.* (citing Ex. 1002 ¶ 118). In other words, Petitioner argues "RFC3104 explicitly discloses a mapping, and Grabelsky supplies an efficient mapping technique in the form of a translation table." *Id.*

In its Sur-Reply, Patent Owner argues that the combination of RFC3104 and Grabelsky fails to teach this limitation. Sur-Reply 24–26. In particular, Patent Owner argues that (i) "Petitioner and its expert fail to account for the modifications that would have to be made to Grabelsky's Figure 21 before it could possibly be combined with RFC3104"; and (ii) "Petitioner and its expert fail to articulate an apparent reason or

motivation for [one of ordinary skill in the art] to make the modifications to Grabelsky's address table." *Id.* at 24–25.

These arguments, however, are new. Nowhere in its Response does Patent Owner make these arguments. *See generally* PO Resp. Patent Owner submits that "[t]he Reply argues that the claimed 'translation table' that determines a destination address using the unique identity from the received secure message is satisfied by Grabelsky's address table in Figure 21." *Id.* at 24 (citing Pet. Reply 14 (citing Pet. 45)). This portion of the Reply, however, relates to dependent claim 4, and its requirements that the "translation table [] includes two partitions." Pet. Reply 14. It does not add anything to Petitioner's showing from the Petition for this limitation for claim 1. *Id.*

Accordingly, we do not consider these arguments because they were not made in the Patent Owner Response and are beyond the proper scope of the Sur-Reply, and thus, are waived. *See* Paper 8 (Scheduling Order), 7 ("Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived."); Consolidated Practice Guide 74 (citing 37 C.F.R. § 42.23) ("Generally, a reply or sur-reply may only respond to arguments raised in the preceding brief.").

After reviewing Petitioner's arguments and evidence, including Dr. Goldschlag's Declaration, we are persuaded that Petitioner demonstrates by a preponderance of the evidence that the combination of RFC3104 and Grabelsky teaches that "the intermediate computer [is] configured to access a translation table, to find a destination address from the translation table using the unique identity."

4. Alleged Erroneous Obviousness Standard

Patent Owner argues that Petitioner's expert, Dr. Goldschlag, applies an incorrect obviousness standard. PO Sur-Reply 11–13. In particular, Patent Owner argues that Dr. Goldschlag opines on "how the prior art references could have been combined," rather than opining that one of ordinary skill in the art "*would* have an apparent reason to combine and/or modify the prior art as proposed." *Id.* at 12 (citing Ex. 1002 ¶ 25; Ex. 1022 ¶ 2). We find this argument unavailing.

This is a new argument, at least with respect to Dr. Goldschlag's declaration submitted with the Petition (Ex. 1002), and should have been raised in Patent Owner's Response, if at all. *See* Paper 8, 7; Consolidated Practice Guide 74 (citing 37 C.F.R. § 42.23). Regardless, Dr. Goldschlag's testimony upon which we rely for the obviousness grounds states that one of ordinary skill in the art "would" (rather than "could") have found it obvious to combine the relevant teachings. *E.g.*, Ex. 1002 ¶ 118.

In addition, we find unavailing Patent Owner's argument that "Dr. Goldschlag's obviousness test also omits the requirement that he must demonstrate that a person of ordinary skill would have a reasonable expectation of success that the proposed combination and/or modification of the prior art would operate for its intended purpose." PO Sur-Reply 13. This argument is untethered to any specific testimony of Dr. Goldschlag, and thus fails to inform us properly of the scope of this argument. Nonetheless, we find Dr. Goldschlag's testimony that we rely on herein sufficiently supported by the factual record for the weight we afford it. *E.g.*, Ex. 1002 ¶ 118. For example, Dr. Goldschlag testifies that "RFC3104 already discloses a 'mapping' of the 'minimum tuple of demultiplexing fields' to a

destination (e.g., the destination address of RSIP client X)," and that "[t]he combination would amount to nothing more than combining known elements to yield predictable results, namely a translation table as in Grabelsky mapping the 'demultiplexing fields' of RFC3104 to the destination address of the IPSec SA." *Id.* (citing Ex. 1004, 5). Furthermore, combining the teachings of RFC3104 and Grabelsky does not require using Grabelsky's specific translation table. *In re Nievelt*, 482 F.2d 965, 968 (CCPA 1973) ("Combining the *teachings* of references does not involve an ability to combine their specific structures."); *see also In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012) ("It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements." (citing *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc))).

5. Summary

In summary, based on the arguments and evidence of record discussed above, we find that Petitioner has demonstrated by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103(a) based on RFC3104 and Grabelsky.

D. Challenged Claim 2

Claim 2 depends from independent claim 1, and recites "[t]he intermediate computer of claim 1, wherein the intermediate computer is further configured to substitute the unique identity read from the secure message with another unique identity prior to forwarding the encrypted data payload." Ex. 1001, 22:66–23:3. Petitioner argues that "RFC3104, alone or in combination with Grabelsky," teaches this limitation. Pet. 50–52. We disagree.

Petitioner argues that RFC3104 describes "tunnel[ing] the packet to X according to the tunneling mode in effect," and that one of ordinary skill in the art "would have understood that tunneling the packet involves adding or replacing an outer IP header of the packet with an IP header that includes the destination address of host X." *Id.* at 50 (citing Ex. 1004, 5; Ex. 1002 ¶ 125) (emphasis omitted). Petitioner fails to show, however, that "tunneling the [RFC3104] packet involves . . . *replacing* an outer IP header of the packet with an IP header that includes the destination address of host X." *Id.* (emphasis added). Likewise, we find unavailing Petitioner's argument that "the parameter values that make up the second '*unique identity*' (i.e., the new IP header and IPSec protocol header) are different than the parameter values that make up the original '*unique identity*' (i.e., the replaced IP header and IPSec protocol header)." *Id.* at 51 (citing Ex. 1002 ¶ 127). This too fails to show "replacing," but instead shows "adding to" the first unique identity. As we explain above, however, we adopt Patent Owner's construction that "substitute" means "changing, replacing, or modifying, not merely adding to." *See supra* Section IV(C) (construing substitute). Thus, we agree with Patent Owner, and find that record evidence does not indicate that RFC3104's "tunneling" involves anything but "adding to." PO Resp. 53–55.

In addition, Dr. Goldschlag's testimony provides no factual basis in support of Petitioner's argument that one of ordinary skill in the art would have understood that tunneling as described in RFC3104 involves replacing one thing for another. *See generally* Ex. 1002 ¶¶ 125–128. Such *ipse dixit* is insufficient. *See Securus Techs. Inc. v. Glob. Tel*Link Corp.*, 701 F. App'x 971, 974–976 (Fed. Cir. 2017) (affirming the Board's determination

that conclusory testimony by an expert witness was insufficient to satisfy Petitioner's burden of showing that the skilled artisan would have modified the references as asserted); *see also* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight."). Thus, we give little weight to such unsupported conclusions.

Moreover, and independently, record evidence describes tunneling as adding something to an existing packet, not replacing one thing for another within a packet. For instance, the '494 patent describes tunneling in the context of adding a header to an existing packet, not replacing a header. Ex. 1001, 3:21–47. Grabelsky also describes tunneling in the context of adding a header, not replacing a header. Ex. 1006, 21:52–55, 32:42–47.

Petitioner also argues that one of ordinary skill in the art "would have been specifically motivated to replace the outer IP header of the packet with a new IP header in order to minimize packet size and reduce overhead." Pet. 50–51 (citing Ex. 1002 ¶ 126). Petitioner's argument, however, is based on the premise that "tunneling" includes replacing, which as we state above, has not been shown. In other words, Petitioner fails to direct us to evidence, beyond Dr. Goldschlag's conclusory testimony, showing a person having ordinary skill in the art at the time of the invention even knew that replacing the outer IP header of the packet with a new IP header was an option. *See Securus Techs. Inc.*, 701 F. App'x at 974–976; *see also* 37 C.F.R. § 42.65(a). In addition, Petitioner directs us to no evidence, beyond Dr. Goldschlag's conclusory testimony, to support its assertion that one of ordinary skill in the art at the time of the invention would have been motivated to replace "the

outer IP header of the packet with a new IP header" in order to "minimize packet size and reduce overhead." *Id.*

For all of these reasons, we find that Petitioner has not demonstrated by a preponderance of the evidence that claim 2 is unpatentable under 35 U.S.C. § 103(a) based on RFC3104 and Grabelsky.

E. Challenged Claims 3, 5, 8, and 10

Petitioner argues, with specific cites to the references and Dr. Goldschlag's testimony, that the combination of RFC3104 and Grabelsky teaches the limitations recited in claims 3, 5, 8, and 10. Pet. 52–55, 58–59.

Patent Owner did not separately address Petitioner's arguments directed to these claims. PO Resp. 58 (arguing that "[d]ependent claims 3, 5, 8 and 10 are patentable over the combination of RFC3104 and Grabelsky for at least the reasons set forth above for independent claim 1"); *see generally* PO Sur-Reply.

Based on the evidence and arguments presented in the Petition, we find that Petitioner has demonstrated by a preponderance of the evidence that claims 3, 5, 8, and 10 would have been obvious to one of ordinary skill in the art over the combined teachings of RFC3104 and Grabelsky.

F. Challenged Claim 4

Claim 4 depends from independent claim 1, and recites:

> The intermediate computer of claim 1, wherein the translation table includes two partitions, the first partition containing information fields related to the connection over which the secure message is sent to the first network address, the second partition containing information fields related to the connection over which the forwarded encrypted data payload is sent to the destination address.

Ex. 1001, 23:6–12. Petitioner argues that "RFC3104, alone or in combination with Grabelsky, teaches" this limitation. Pet. 53–55; Pet. Reply 14–19. We disagree.

First, we disagree with Petitioner that one of ordinary skill in the art would have understood that "'the second partition containing information fields related to the connection over which the forwarded encrypted data payload is sent to the destination address' to simply refer to the *type* of fields that make up the second partition, not the number of fields that must be present." Pet. Reply 15–16 (citing Ex. 1022 ¶ 34). Nor do we find persuasive Petitioner's argument that the language "do[es] *not* recite 'a plurality' of information fields." *Id.* at 15. Rather, we agree with Patent Owner that claim 4 requires "that the second partition has more than one field." PO Resp. 59–61. The claim recites "fields," which is plural and, thus, requires two or more fields. Ex. 1001, 23:8. Petitioner does not cite to any portion of the Specification or other claim language that supports finding that "fields" includes the singular. *See generally* Pet.; Pet. Reply. Rather, Petitioner reads "fields" out of the claim in arguing that "the information contained in the second partition must merely relate to '*the connection over which the forwarded encrypted data payload is sent to the destination address*.'" Pet. Reply 16. We likewise find Petitioner's citation to the Specification for this argument unavailing because it is directed to what the "information" is related, instead of the number of required "fields." *Id.* (citing Ex. 1001, 11:45–47). In addition, we find Dr. Goldschlag's testimony that one of ordinary skill in the art would have understood that information fields simply "refer to the *type* of fields that make up the second partition, not the number of fields that must be present" unsupported by

factual evidence, and we give it little weight. *See* Ex. 1022 ¶ 34; 37 C.F.R. § 42.65(a).

Second, we agree with Patent Owner that the combination of RFC3104 and Grabelsky fails to teach that the second partition contains "information *fields* related to the connection over which the forwarded encrypted data payload is sent to the destination address." PO Resp. 60–61 (emphasis added). More specifically, we agree with Patent Owner and find that "[t]he column in Grabelsky that is the claimed second partition according to Petitioner's argument has only a single field—Internal Network Address 294," rather than two or more fields. *Id.* at 61; *see also* Ex. 1006, Fig. 21; Pet. 54 (citing Ex. 1002 ¶ 132).

Moreover, we find unavailing Petitioner's reliance on Dr. Goldschlag's testimony for having more than one field. Dr. Goldschlag testifies that one of ordinary skill in the art

> would have been motivated to include *more than the destination address* of the IPSec SA *in the second partition*, for example also including the other "demultiplexing fields" (i.e., the SPI and protocol) so that values of the first partition could simply be substituted with values of the second partition in the data packet sent from server N to host X.

Pet. 54 (citing Ex. 1002 ¶ 132); Pet. Reply 16. Dr. Goldschlag also testifies that "RFC3104 further suggests a multitude of other fields that [one of ordinary skill in the art] . . . *would naturally have included* in the second partition in addition to those examples provided in the Petition." Ex. 1022 ¶ 35 (emphasis added); Pet. Reply 16. Dr. Goldschlag cites, for example, RFC3104's teaching of a "ASSIGN_REQUEST_RSIPSEC" message, which he testifies "'is used by an RSIP client to request IPsec parameter assignments,' including fields such as 'an IP address and SPIs.'"

Ex. 1022 ¶ 36 (quoting Ex. 1002 ¶ 137) (citing Ex. 1004, 7); Pet. 57; Pet. Reply 16.

In addition, Dr. Goldschlag testifies that the "ASSIGN_REQUEST_ RSIPSEC message is sent by Host X to request a *binding* such that Server N allocates resources for Host X to subsequently establish an IPSec secure connection," and that "[t]he parameters of this binding[, such as Lease Time,] are stored at RSIP server N." Ex. 1002 ¶ 37 (quoting Ex. 2002 ¶ 110; citing Ex. 2004, 5), ¶ 38; Pet. Reply 17. According to Dr. Goldschlag, "this binding forms the 'mapping' that RFC3104 refers to when demultiplexing 'IPsec packets from Y destined for X.'" *Id.* (citing Ex. 1004, 5; Ex. 1002 ¶¶ 103–104); Pet. Reply 17–18. Dr. Goldschlag testifies that because "this binding is stored at the RSIP server N, [one of ordinary skill in the art] . . . would have recognized that *it would be logical* to store the parameters of this binding together." Ex. 1022 ¶ 39 (emphasis added); Pet. Reply 18. Dr. Goldschlag opines that "in the combination of RFC3104 and Grabelsky, these parameters *could be, and most logically would be*, stored in the translation table," and that "it would have been obvious to include the assigned parameters in the table's 'second partition' so that the parameters could easily be retrieved based on RFC3104's 'minimum tuple of demultiplexing fields.'" Ex. 1022 ¶ 39 (citing Ex. 1004, 5) (emphasis omitted and added); Pet. Reply 18–19.

We are not persuaded by Dr. Goldschlag's testimony, which in our view, and taken as a whole, is improperly guided by hindsight to reconstruct the invention of claim 4. *See Metalcraft of Mayville, Inc. v. The Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017) ("[W]e cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the

claimed invention."); *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) ("It is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." (citation omitted)).

Dr. Goldschlag opines, for example, that (i) there are "a multitude of other fields that [one of ordinary skill in the art] . . . *would naturally have included* in the second partition"; (ii) "*it would be logical* to store the parameters of th[e] binding together"; and (iii) "these parameters *could be, and most logically would be*, stored in the translation table." Ex. 1022 ¶¶ 35, 39 (emphases added). We find these opinions are akin to arguing what *could* be combined, and evidences hindsight bias. *See id.*; *see also InTouch Tech., Inc. v. VGO Comm., Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (finding hindsight bias in expert testimony that "primarily consisted of conclusory references to [the] belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so").

Also, we find conclusory Dr. Goldschlag's testimony that one of ordinary skill in the art "would have been motivated to include more than the destination address of the IPSec SA in the second partition . . . so that values of the first partition could simply be substituted with values of the second partition in the data packet sent from server N to host X." Ex. 1002 ¶ 132. There is no factual support underlying Dr. Goldschlag's opinion that one of ordinary skill in the art would have been so motivated. We also find conclusory Dr. Goldschlag's testimony that "it would have been obvious to include the assigned parameters in the table's 'second partition' so that the parameters could *easily* be retrieved based on RFC3104's 'minimum tuple

of demultiplexing fields.'" Ex. 1022 ¶ 39 (emphasis added). Such a statement "that the parameters could *easily* be retrieved" is generic, and fails to provide necessary factual support — it is akin to stating in a conclusory fashion that the combination "would have been obvious." *See In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017); *see also ActiveVideo Networks Inc. v. Verizon Comm., Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012) (finding expert testimony of motivation to combine "to build something better," "more efficient, cheaper, or" something that "had more features" without underlying evidence was generic and insufficient).

Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claim 4 of the '494 patent would have been obvious to one of ordinary skill in the art in view of RFC3104 and Grabelsky.

G. Challenged Claim 9

Claim 9 depends from independent claim 1, and recites:

> The intermediate computer of claim 1, wherein the intermediate computer is configured to modify the translation table entry address fields in response to a signaling message sent from the mobile computer when the mobile computer changes its address such that the intermediate computer can know that the address of the mobile computer is changed.

Ex. 1001, 24:7–13. Petitioner argues that RFC3104 teaches this limitation. Pet. 56–58; Pet. Reply 19–22. We disagree.

Claim 9 requires, *inter alia*, that "the intermediate computer is configured to *modify* the translation table entry address fields in response to a signaling message." Ex. 1001, 24:8–10 (emphasis added). Petitioner argues that RFC3104's ASSIGN_REQUEST_RSIPSEC message acts as the signaling message. Pet. 58 (citing Ex. 1004, 7; Ex. 1002 ¶ 139). According to Petitioner, a ASSIGN_REQUEST_RSIPSEC message requests IPSec

parameter assignments, and once assigned, "an SA can be established between the RSIP client and its peer." *Id.* at 57 (citing Ex. 1004, 5; Ex. 1002 ¶ 137). Petitioner argues that this includes "creating a table entry mapping the 'minimum tuple of demultiplexing fields' to the network address of the RSIP client." *Id.* at 58 (citing Ex. 1004, 5; Ex. 1002 ¶ 138). Put differently, "for packets sent from Y to RSIP client X, RSIP server N would require adding a table entry mapping the 'minimum tuple of demultiplexing fields' to the network address of RSIP client X," according to Petitioner. *Id.* (citing Ex. 1004, 5; Ex. 1002 ¶¶ 139–140). Petitioner argues that adding this table entry teaches "modify[ing] the translation table entry address fields." *Id.*

We are not persuaded by Petitioner's arguments. The plain language of claim 9 requires "modify[ing] the translation table entry address fields." In other words, the claim recites "modify[ing]," which requires having *existing* address fields in the translation table when the mobile changes its address. Petitioner sets forth no persuasive arguments that "modify[ing]" the address fields covers "creating" or "adding" a table entry having new address fields. *See* Pet. 56–58; Pet. Reply 19–22. Moreover, modifying the translation table entry address fields occurs "when the mobile computer changes its address such that the intermediate computer can know that the address of the mobile computer is changed." Ex. 1001, 24:10–13. This supports that the translation table had an existing table entry with existing address fields for the mobile computer because otherwise, the intermediate computer would not know that there is an address that changed, as opposed to simply a new connection. Furthermore, having existing address fields in an existing entry is consistent with the '494 patent's Specification, which discloses the following:

> The first computer may be a mobile terminal, the outer address of which changes from time to time. The translation table is then modified using some form of signalling messages, as described in the summary section. Upon receiving a request for modifying a translation, the intermediate computer updates the related translation table entry to match the new information supplied by the first computer.

Ex. 1001, 13:19–25. In particular, the Specification discloses that "the intermediate computer *updates* the related translation table entry to match the new information," which by the plain meaning of "updates," requires an existing entry and existing address fields.

Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claim 9 of the '494 patent would have been obvious to one of ordinary skill in the art in view of RFC3104 and Grabelsky.

H. Challenged Claim 11

Claim 11 depends from independent claim 1, and recites "[t]he intermediate computer of claim 1, wherein the source address of the forwarded message is the same as the first network address." Ex. 1001, 24:16–18. Petitioner argues that RFC3104 in view of Grabelsky, teaches this limitation. Pet. 46–50, 59; Pet. Reply 22–26. We disagree.

Petitioner fails to show that "the source address of the forwarded message is *the same* as the first network address," as recited in the claim. Ex. 1001, 24:16–18 (emphasis added). Notably, Petitioner "does not assert that addresses Na and Nb are the same address." Pet. Reply 22; *see also* Ex. 1022 ¶ 45 (Petitioner's expert, Dr. Goldschlag, declaring that "[n]either the Petition nor my original declaration asserts that addresses Na and Nb are the same address"). Rather, Petitioner argues that each of Na and Nb is a first network address, and "when a message sent from Y to X is received by RSIP

server N on the Nb interface, it must also be sent to the Na interface so that the Na interface can ultimately forward the message to client X." Pet. Reply 22–23 (citing Pet. 31, 48; Ex. 1002 ¶87) (emphasis omitted); *see also* Pet. 49 (citing Ex. 1002 ¶ 122) (arguing that a secure message sent to RSIP server N via address Nb is also sent to address Na as part of RFC3104's tunneling operation). But, there is no record evidence that the mobile computer sends the message directly to the Nb address. Rather, the immediate computer "would have to process and forward those packets from Address Space B to Address Space A." Pet. Reply 25 (quoting Ex. 1023, 82:11–83:6; citing Ex. 1022 ¶¶ 48–49) (emphasis omitted). Thus, "the intermediate computer has a source address for each network, both of which identify the same computer." Ex. 1002 ¶ 120. This is not the same as showing that address Na and Nb are the same, as the claim language requires. *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998) ("[T]he name of the game is the claim."). We find Dr. Goldschlag's testimony cited for this limitation is contrary to these findings and we afford it little weight.

Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claim 11 of the '494 patent would have been obvious to one of ordinary skill in the art in view of RFC3104 and Grabelsky.

VII. ALLEGED OBVIOUSNESS OVER RFC3104, GRABELSKY, AND WAGNER

Petitioner argues, with specific cites to the references and Dr. Goldschlag's testimony, that the combination of RFC3104, Grabelsky, and Wagner renders claims 6 and 7 obvious. Pet. 59–64.

Patent Owner did not separately address Petitioner's arguments directed to these claims. PO Resp. 65 (arguing that "[c]laims 6–7 are

patentable over the cited prior art for at least the reasons set forth for claim 1 addressed for" the RFC3104 and Grabelsky ground); *see generally* PO Sur-Reply.

Based on the evidence and arguments presented in the Petition, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 6 and 7 would have been obvious over the combined teachings of RFC3104, Grabelsky, and Wagner.

VIII. CONSTITUTIONAL CHALLENGE

Patent Owner argues that Administrative Patent Judges are unconstitutionally appointed principal officers, and that the decision in *Arthrex, Inc. v. Smith & Nephew, Inc.*, 941 F.3d 1320, 1337 (Fed. Cir. 2019), *cert. granted sub nom. United States v. Arthrex, Inc.*, 2020 WL 6037206 (Oct. 13, 2020) was inadequate to cure the Constitutional violation. PO Resp. 65–66. We note that Patent Owner's constitutional challenge was addressed by the Federal Circuit's *Arthrex* decision. *Arthrex*, 941 F.3d at 1337 ("This as-applied severance . . . cures the constitutional violation."); *see also Arthrex, Inc. v. Smith & Nephew, Inc.*, 953 F.3d 760, 764 (Fed. Cir. 2020) (en banc) (Moore, J., concurring in denial of rehearing) ("Because the APJs were constitutionally appointed as of the implementation of the severance, *inter partes* review decisions going forward were no longer rendered by unconstitutional panels."). Accordingly, we do not consider this issue any further.

Patent Owner also argues that "the challenged patent was applied for and published before enactment of the America Invents Act (AIA)," and that "[s]ubjecting such patents to AIA proceedings is an unconstitutional taking of property without just compensation and an unconstitutional deprivation of

property without due process." PO Resp. at 66 (citation omitted). With regard to the Takings and Due Process Clause challenges, we note that challenges to retroactive application of IPRs to pre-AIA patents have been addressed by the Federal Circuit in *Celgene Corp. v. Peter*, 931 F.3d 1342, 1357–1363 (Fed. Cir. 2019), *cert. denied* 2020 WL 3405867 (June 22, 2020) (Takings Clause) and *Sound View Innovations, LLC v. Hulu, LLC*, Nos. 2019-1865, 2019-1867, 2020 WL 3583556, *3 (Fed. Cir. July 2, 2020) (non-precedential) (Due Process Clause). Accordingly, we do not consider this issue any further.

IX. CONCLUSION[13]

Based on the full record before us, we determine that Petitioner has demonstrated by a preponderance of the evidence that (i) claims 1, 3, 5, 8, and 10 of the '494 patent are unpatentable under 35 U.S.C. § 103(a) in view of RFC3104 and Grabelsky; and (ii) claims 6 and 7 are unpatentable under 35 U.S.C. § 103(a) in view of RFC3104, Grabelsky, and Wagner. We also determine that Petitioner has not demonstrated by a preponderance of the evidence that claims 2, 4, 9, and 11 of the '494 patent are unpatentable under 35 U.S.C. § 103(a) in view of RFC3104 and Grabelsky.

[13] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

Claim(s)	35 U.S.C §	Reference(s) /Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5, 8–11	103(a)	RFC3104, Grabelsky	1, 3, 5, 8, 10	2, 4, 9, 11
6, 7	103(a)	RFC3104, Grabelsky, Wagner	6, 7	
Overall Outcome			1, 3, 5–8, 10	2, 4, 9, 11

X. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), Petitioner has shown by a preponderance of the evidence that claims 1, 3, 5–8, and 10 of the '494 patent are unpatentable;

FURTHER ORDERED that Petitioner has not shown by a preponderance of the evidence that claims 2, 4, 9, and 11 of the '494 patent are unpatentable; and

FURTHER ORDERED that parties to the proceeding seeking judicial review of this Final Written Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2019-00823
Patent 9,712,494 B2

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